I. REMARKS

A. Status of Claims

Claims 1-27 and Claims 51-52 are pending in the Application. New Claims 53-57 are added herein. Claims 3, 5, 6, 8-11, 13-16, and 18-27 are withdrawn from consideration. Claims 28-50 were previously cancelled. Claims 1, 2, 4, 7, 12, 17, 27, 51, and 52 are being considered herein.

The cancellation of the above claims should not be construed as an abandonment of the subject matter covered by the cancelled claims. Applicant reserves the right to file one or more divisional applications directed to this subject matter.

B. Support for Addition of Method Claims

Applicants have added new Claims 56 and 57 directed to a method of using the microemulsions of Claim 1. Entry of these new "method of use" claims is appropriate as the method of use claims are merely another way of claiming the unique microemulsion described in Claim 1. Further, entry of new Claims 56 and 57 should not require a burdensome new search as methods of using the various formulations described in the cited art are amply illustrated.

Applicants' specification provides ample support for the method of use claims in the specification as a whole and particularly in the examples.

C. Petition for Extension of Time

Accompanying this Response is a Petition for Extension of Time (PTO/SB/22) for a 3-month extension of time as well as the required fee.

II. REJECTION UNDER 35 USC §102(b)

Claims 1, 2, 7, 17, and 27 stand rejected under 35 USC §102(b) as being anticipated by Ward *et al.* (US 6,093,681) and Gillespie *et al.* (US 6,093,680).

The Ward and Gillespie references are related to each other as both claim priority to the same provisional applications. The Ward and Gillespie references are both assigned to Monsanto Company the inventor of Roundup® (glyphosate) herbicide. Monsanto has formulated glyphosate in a myriad of forms many of which are described in Ward at Col. 4, lines 51-65 and Col. 5, lines 1-18. These formulations include:

1. Ready to spray dilute aqueous solutions;
2. Shelf-stable aqueous concentrate that must be diluted before application;
3. Shelf-stable granular composition that must be added to a liquid usually water before application;
4. Oil in water (O/W) emulsion;
5. Water in oil (W/O) emulsion;
6. Water in oil in water (WOW) emulsion; and
7. Liposomes.

An emulsion is a 2-phase system containing a continuous phase and a discontinuous phase dispersed therein. A microemulsion is a quite different type of colloidal dispersion from mini- and normal emulsions. Normal emulsions have a discontinuous phase particle size having a radius of 1 – 10 μm. A mini-emulsion usually has a discontinuous phase particle size of about 400nm. In contrast, a microemulsion has a discontinuous phase particle size having radii in the 10nm range. While common emulsions and mini-emulsions are inherently colloidally unstable, a microemulsion is a thermodynamically stable system.

Neither the Ward reference nor the Gillespie reference describes or claims any microemulsion much less the non-aqueous oil-continuous microemulsion taught by the present invention.

Examiner contends that Ward et al teach a composition comprising 20% glyphosate, Span 80 (surfactant), Tween 20 (polyoxyethylene sorbitol) surfactant, and butyl stearate (fatty acid ester) and points to Example F-1 and F-2.

Claims 1, 2,4,6,7,17,and 27 are further rejected as being anticipated by the Gillespie *et al* reference (US 6,093,680), Examiner asserting that Gillespie *et al* teach a composition comprising 20% glyphosate, Span 80 (surfactant), Tween 20 (polyoxyethylene sorbitol) surfactant, and methyl oleate (fatty acid ester). Examples 12-17 are cited in support of the Section 102 rejection.

The compositions (formulations) disclosed by Ward and Gillespie in the cited Examples are all water-in-oil–in-water multiple emulsions. One skilled in this art would recognize that the physical form of the formulation is critical. As evidenced by the references cited by Examiner and the references cited by Applicants herein, although agricultural formulators use the same building blocks, e.g., surfactants, stabilizers, antioxidants, etc., to formulate active agents such as herbicides how they put the parts

of the formulation together is very different. A water-in-oil–in-water multiple emulsion is not the same physical entity as a regular microemulsion much less the non-aqueous, oil-continuous microemulsion of Applicants' invention.

In order to "anticipate" an invention a prior reference must disclose to one of ordinary skill in the art all elements and limitations of the patent claim. See *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1576 (1991). If the prior art reference lacks an element of a claim at issue it can not anticipate. See *Al-Site Corp v. Opti-Ray Inc.* 28 USPQ2nd 1915, 1920 (E.D. N.Y. (1993).

The words "non-aqueous, oil-continuous microemulsion" used in Applicants' claims are not merely descriptive but are substantive limitations on the specific composition described by independent Claim 1. As discussed above, neither the Ward reference nor the Gillespie reference describe or teache a non-aqueous, oil-continuous microemulsion. Accordingly, neither of these references anticipates Applicants' Claims 1, 2, 7, 17, and 27.

III. REJECTION UNDER 35 USC §103(a)

A. The Invention

The invention described herein is directed to an herbicidal composition which is a shelf-stable, non-aqueous, oil-continuous microemulsion where the herbicide is a solubilized polar active agent comprising (i) an oil component, (ii) a non-aqueous polar solvent, (iii) an amphiphilic compound and (iv)the active agent. The invention is further directed to a method of inhibiting the growth of undesirable vegetation by application of the non-aqueous, oil-continuous microemulsion described herein.

B. Rejection under Section 103 over Gillespie in view of Iwasaki

Claim 12 is rejected under Section 103 as being unpatentable over Gillespie taken with Iwasaki (US 5,612,322). Examiner states that Applicants claim a composition where Claim 12 limits the polar solvent to an amine selected from ethylene diamine, ethanolamine, diethanolamine, triethanolamine, and combinations thereof.

Examiner asserts that Iwasaki teaches that ethylene diamine, ethanolamine, diethanolamine, triethanolamine, and combinations thereof are excellent activating agents for biocides in combination with monoesters, particularly polyoxyalkylene alkyl ethers (Col. 2, lines 5- 16). The biocides include glyphosate (Col. 3, lines 29-31).

C. Rejection under Section 103 over Gillespie in view of Iwasaki and Kuchikata

Claims 51 and 52 stand rejected under 35 USC §103(a) as being unpatentable over Gillespie in view of Iwasaki, and further in view of Kuchikata *et al.* (US 6,228,807).

Examiner states that Claim 51 and Claim 52 specify that the polar solvent is monoethanolamine while Claims 51 and 52 describe the amphiphilic material to be selected from N, N-(dihydroxyethyl) oleylamine and polyoxyethylene (2) oleyl ether and combinations thereof and specifically (Claim 52) polyoxyethylene oleyl ether.

Examiner admits that Gillespie and Iwasaki do not teach the use of polyoxy-alkylene alkyl ethers with activating agents such as monoethanolamine. However, Kuchikata does teach the use of polyoxyethylene oleyl ether surfactant with glyphosate (Col. 2, lines 58-65 and Col.6, line 3).

Based on this reasoning, Examiner contends that it would have been obvious to one of ordinalry skill at the time of Applicants' invention to combine the teachings of Gillespie, Iwasaki and Kuchikata to include polyoxyethylene oleyl ether. One would have been motivated to include polyoxyethylene oleyl ether because Kuchikata teaches that it is a suitable surfactant and since Iwasaki teaches that polyoxyalkylene alkyl ethers are combined with activating agents such as monoethanolamine in glyphosate formulations.

1. The Iwasaki Reference

The Iwasaki reference (US 5,612,322) teaches the use of "activators" to enhance the activity of biocides such as herbicides among which is glyphosate. The reference does not teach the use of polyoxyethylene alkyl ether surfactants and specifically polyoxyethylene oleyl ether but rather, the activators disclosed by Iwasaki (Col. 1, lines 25-41) include an alkyl phosphate, an alkenyl phosphate, a hydroxyalkyl phosphate, a polyoxyalkylene alkyl ether phosphate, a salt thereof, a polyoxyalkylene alkenyl ether phosphate, a salt thereof, a polyoxyalkylene hydroxyalkyl ether phosphate and a salt thereof.

Further there is noting in Iwasaki which describes or suggests the non-aqueous, oil-continuous microemulsions of Applicants' invention. Iwasaki teaches that his invention may be provided in the form of an emulsion concentrate which comprises 10 to 70 weight percent of the biocide and 10 to 50 weight percent of the biocide activator, 3 to 20 weight percent of an emulsifier and 10 to 50 percent weight of an organic solvent, or a dilute composition which comprises 100 to 5,000 ppm of the biocide, preferably 500 to 5,000 ppm, of the biocide activator and a carrier for dilution.

Clearly, in the invention taught by Iwasaki, the polyoxyalkylene hydroxyalkyl ether phosphate activators are not taught as the same thing as emulsifiers such as polyoxyethylene oleyl ether. In fact, Kao, the assignee of the Iwasaki reference markets such ether emulsifiers under the trade name "EMULGEN".

2. Kuchikata *et al* Reference

The Kuchikata et al reference (US 6,228,807) is directed to a dry, water soluble, and/or water dispersible granular herbicide composition. There is noting in the Kuchikata reference that describes a microemulsion much less the specific microemulsion of Applicants' invention.

IV. SUMMARY

The references of record disclose the types of herbicidal formulations listed in Table I below.

Table I
PRIOR ART HERBICIDE PRODUCT FORMS
1. Ready to spray dilute aqueous solutions;
2. Shelf-stable aqueous concentrates that must be diluted before application;
3. Shelf-stable granular composition that must be added to a liquid usually water before application;
4. Oil in water (O/W) emulsion;
5. Water in oil (W/O) emulsion;
6. Water in oil in water (WOW) emulsion; and
7. Liposomes.

The invention described herein is directed to a water-free (non-aqueous), oil-continuous microemulsion containing a herbicide as the active agent where the active agent is solubilized in a non-aqueous polar solvent. The invention is further directed to a method of inhibiting the growth of undesirable vegetation by application of the non-aqueous, oil-continuous microemulsion described herein. None of the references cited herein describe or suggest a microemulsion much less water free, oil continuous microemulsions.

When Applicants attorney used the Delphion data-base to search the terms "herbicidal microemulsion" for the period 1980 to 2004, as evidenced by the attached

Exhibit A which is a print-out of the results of the search, 7 matches were found. None of these references described other than a conventional water continuous microemulsion. However, several of the references listed in Exhibit A do teach the desirability of formulating herbicides as microemulsions because of the inherent stability of microemulsions.

Monsanto Company the original developer of Roundup® (N-phosphonomethylglycine or glyphosate) herbicide has obviously been highly motivated to develop advantageous formulations of glyphosate as evidenced by the teachings of Ward et al and Gillespie et al cited by Examiner herein.

Despite all of the work done to develop commercial formulations of glyphosate herbicide, none of the references of record teach the use of a water-free, oil-continuous microemulsion. Further, even if the references did lead one to prepare oil-continuous microemulsions, the references do not provide any teaching or expectation that one would achieve the superior herbicidal results achieved by Applicants formulation when applied to undesirable vegetation.

As evidenced by the data reported in Applicants' specification, the oil-continuous microemulsions of Applicants' invention out-performed Roundup® herbicide when sprayed on undesirable weeds and when applied to a field of Roundup® resistant soybean plants. The data in Table 8 indicates that at the same dose of active agent (kg/Ha), when microemulsions formulated in accordance with Applicants' invention were applied to ragweed, velvetleaf and giant foxtail, Applicants formulations controlled ragweed and velvetleaf over 50% better than Roundup while controlling giant foxtail at the same rate.

Table 10 illustrates the superior biological performance of formulations of the invention. At 14-days after the herbicide was applied all of the invention formulations provided 100% kill the same kill rate as Roundup. However, the invention formulations were able to do so when applied at rates at least half that of the conventional Roundup dose. When visual observations were made 4-days after treatment, the invention formulations that were applied at a much lower rate than the conventional Roundup rate of 2.08 kg/Ha produced about the same rate of kill as the Roundup formulation conventional dose (about 60% kill). However, when Roundup was applied at half its recommended dose (1.04 kg/Ha), significantly less kill was observed. The data in Table 10 clearly illustrates that using lower concentrations of the oil-continuous microemulsions of the invention (kg/Ha) one was able to achieve the same results (i.e., kill of weeds) as was obtained at the much greater conventional dose of Roundup.

It is respectfully contended that Examiner has not made out a case of *prima facie* obviousness. None of the references of record describe or suggest a microemulsion. Further, while the references listed in Exhibit A attached and provided in the IDS

submitted herewith describe agricultural microemulsions, none teach the non-aqueous, oil-continuous microemulsion described and claimed herein. As would be recognized by colloid chemists much less a skilled agricultural formulator, a microemulsion is a unique type of colloidal dispersion.

Based on the arguments and evidence provided herein, it is respectfully asserted that Applicants' invention as a whole is patentable and should not be limited to the previously elected species. Accordingly, Examiner is requested to reinstate the withdrawn claims and to examine them for compliance with Section 112. It is further contended that Applicant should be allowed to add additional new claims directed to various aspects of Applicants independent method of use claim.

V. Conclusion

Based on the amendments and arguments made herein, it is respectfully asserted that Examiner's rejections have been overcome and that this application is in condition for allowance. Examiner is respectfully requested to withdraw all rejections and to issue a Notice of Allowance. If there are any questions regarding these amendments and remarks, Examiner is encouraged to contact the undersigned at the telephone number provided below.

Respectfully submitted,

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EXHIBIT A

THOMSON DELPHION

Search results for: ((((herbicidal microemulsion)) AND (PD>=1970-01-01)) AND (PD<=2002-12-31))

Collections searched: US (Granted - Full text), US (Applications - Full text)

7 matches found of 6,747,138 patents searched

Displaying results 1 - 7 of 7

Publication	Title	Pub. Date	Filed	Score
US5106410	Fatty acid based herbicidal compositions	1992-04-21	1990-09-26	89%
US5098467	Fatty acid based herbicidal compositions	1992-03-24	1991-06-04	89%
US4975110	Fatty acid based herbicidal compositions	1990-12-04	1989-10-13	89%
US20020183206A1	Coformulation of carfentrazone-ethyl and a water-soluble herbicide	2002-12-05	2002-02-14	87%
US6369001	Microemulsion coformulation of a graminicide and a water-soluble herbicide	2002-04-09	2000-08-04	80%
US5565409	Liquid concentrated herbicidal microemulsion compositions comprising glyphosate and either oxyfluorfen or acifluorfen	1996-10-15	1994-03-28	80%
US4995900	Herbidical aqueous based microemulsion compositions	1991-02-26	1988-11-30	80%

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